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(54) FLAT CONTACT BUSHING

(57) The invention relates to a flat contact socket (1) with a connection section (3) for electrically connecting to an electrical conductor and to a flat contact receptacle (9), which extends along a flat contact plane (11) in a socket body (7), which is spaced apart from the connection section (3), and into which a flat contact (63) can be inserted through an insertion opening (13) along the insertion direction (17), wherein the flat contact socket (1) has at least one blocking element (15) which is opposite the insertion opening (13) in the insertion direction (17) and which delimits the flat contact receptacle (9) at least in the insertion direction (17). In order to provide a flat contact socket (1) which is compact, can be produced cost efficiently, and allows flat contacts with touch protectors to be received, it is intended according to the invention that the at least one blocking element (15) protrudes transverse to the insertion direction (17) from at least one cantilever (31) which extends in the insertion direction (17).

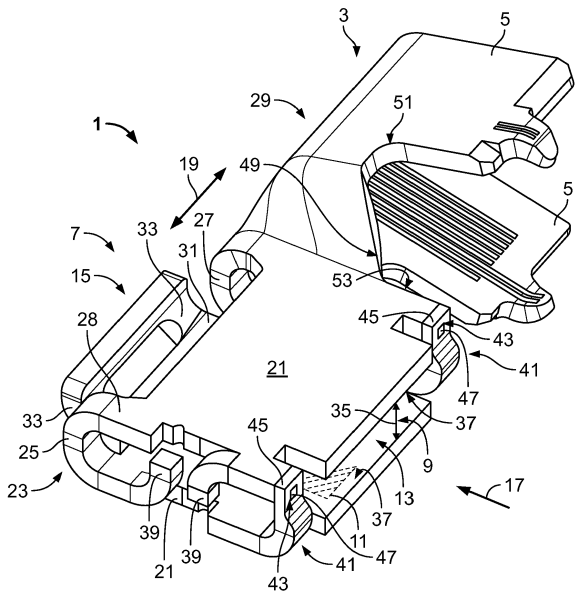

Fig. 1

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Description

[0001] The invention relates to a flat contact socket with a connection section for electrically connecting to an electrical conductor, in particular to a cable, and to a flat contact receptacle, which extends along a flat contact plane in a socket body, which is spaced apart from the connection section, and into which a flat contact can be inserted through an insertion opening along an insertion direction, wherein the flat contact socket has at least one blocking element which is opposite the insertion opening in the insertion direction and which delimits the flat contact receptacle at least in the insertion direction.

[0002] Flat contact sockets, with which an electrical connection between an electrical conductor and a flat contact can be established, are known. Cage-shaped or box-shaped constructions are frequently employed, into which a flat contact can be slid. In particular, such constructions are known into which two flat contacts can be slid, in order to establish an electrical connection between them. Such constructions are also known as connection brackets. However, the disadvantage with such constructions is that they are usually complex to produce, complicated to handle, or can only establish an insufficient mechanical and/or electrical connection between an electrical conductor and a flat contact. Furthermore, the known flat contact sockets frequently only have an insufficiently dimensioned flat contact receptacle, which makes it more difficult or impossible to receive flat contacts which have additional elements, for example a touch protector.

[0003] The problem of the invention is therefore to provide a flat contact socket of the aforementioned type, which overcomes at least one of the aforementioned disadvantages.

[0004] This problem is solved for the flat contact socket according to the invention in that the at least one blocking element protrudes transverse to the insertion direction from at least one cantilever extending in the insertion direction.

[0005] The solution according to the invention enables a blocking element to be produced in a simple manner. As a result of the blocking element protruding from a cantilever extending in the insertion direction, a depth of the flat contact receptacle in the insertion direction can be adapted simply by the length of the cantilever in the insertion direction. This enables the formation of a flat contact receptacle which is suitable for receiving flat contacts with additional elements, for example a touch protector. The blocking element can in particular be formed to be free standing. Similarly, the cantilever can be free standing, such that the at least one blocking element can be viewed as a free end of the cantilever. In particular, the at least one blocking element protrudes transverse to the flat contact plane. The solution according to the invention can be used for both angled connections (90° connections) or for straight-line connections (180° connections). In the case of a 90° connection, the connection section can extend such that in a connected state, an electrical conductor runs transverse to the insertion direction at least in the region of the connection section. In the case of a 180° connection, the connection section can extend such that an electrical conductor runs parallel to the insertion direction at least in the region of the connection section.

[0006] The solution according to the invention can be improved by different configurations which are each advantageous per se and can be combined with each other as desired. These configurations and the advantages connected thereto are explored hereinafter.

[0007] In order to obtain a particularly deep flat contact receptacle, the at least one blocking element can be spaced apart from the rest of the socket body in the insertion direction. This means that at least one blocking element can be downstream of the rest of the socket body in the insertion direction. The blocking element is thus preferably attached to the socket body or connected thereto by the cantilever.

[0008] According to an advantageous configuration, the at least one blocking element can be formed integrally with the rest of the flat contact socket. In particular, the blocking element, the cantilever, the socket body and the connection section can be formed integrally with each other. As a result, on the one hand, a particularly simply designed flat contact socket can be obtained. On the other hand, during production, a subsequent attachment of a cantilever to a blocking element or of a blocking element on the rest of the flat contact socket can be dispensed with.

[0009] The blocking element can have at least one brace, via which said blocking element is connected to the cantilever. In particular, the blocking element can have two braces which are spaced apart from each other. Via the braces, a height of the blocking element or a spacing of the blocking element from the cantilever can be adapted. Moreover, in this way material can be saved in comparison to a solid design. Ultimately, if the blocking element is produced by bending the material of the cantilever, the necessary bending force can, in comparison to a solid design, be reduced.

[0010] In order to effectively delimit the flat contact receptacle in the insertion direction, i.e. to prevent the flat contact being introduced too deeply into the flat contact receptacle, the at least one blocking element can extend up to half the height of the flat contact receptacle measured transverse to the flat contact plane.

[0011] In order to obtain a particularly simply designed socket body, the socket body can have at least two legs which are opposite each other transverse to the flat contact plane, by which legs the flat contact receptacle is delimited transverse to the flat contact plane. The two legs can in particular be orientated substantially flat and parallel to the flat contact plane.

[0012] In order to obtain a stable flat contact socket, the at least two legs can be connected via at least one web, which is opposite the insertion opening in the inser-

tion direction. As a result, in particular the spacing between the at least two legs relative to each other can be defined. In particular in the case of a flat contact socket for a 180° connection, it can also be useful to arrange the at least one web such that as viewed in the insertion direction, it is located laterally from the flat contact receptacle.

[0013] At least one of the legs can have at least one contacting section on an inner face of the leg for electrically contacting the flat contact. The inner face is thus the face directed towards the flat contact receptacle, or the face which delimits the flat contact receptacle. Preferably, the two legs each have a contacting section, which are opposite each other transverse to the flat contact plane.

[0014] In order to improve the electrical contact between the at least one contacting section and a flat contact received in the flat contact receptacle, the at least one contacting section can be provided with at least one contact spring, which projects into the flat contact receptacle and is resiliently deflectable towards the leg. Preferably, the at least one contacting section has a plurality of such contact springs.

[0015] The at least one contact spring does not have to be formed integrally with the leg. In particular, the at least one contacting section can be provided with a contacting plate which has a plurality of contact springs. The contacting plate can be formed from a material which was chosen with a good electrical conductivity in mind. The at least one contacting plate is preferably connected to the inner face of at least one leg by material engagement, in particular by welding. Preferably, each of the at least two legs is provided with at least one contacting plate, which are opposite each other transverse to the flat contact receptacle.

[0016] The flat contact socket can have a base which runs transverse to the insertion direction, which is opposite the insertion opening in the insertion direction, and by means of which the socket body is connected to the connection section. In this way, both a stable flat contact socket and also a good electrical connection between the connection section and the socket body can be obtained.

[0017] A base which runs transverse to the insertion direction can be useful in particular for a flat contact socket for a 90° connection. In particular in an embodiment of the flat contact socket according to the invention, which is intended to be used for a 180° connection, the base can also run parallel to the insertion direction.

[0018] In order to easily connect the connection section to an electrical conductor, in particular a cable, the connection section can have at least two crimping wings for connecting to at least one electrical conductor by means of crimping.

[0019] For producing a positive engagement with a housing, the flat contact socket can have at least one positive engagement recess extending into the flat contact socket substantially parallel or transverse to the insertion direction. The at least one positive engagement recess can be arranged in particular between the connection section and the socket body. In order to obtain a good electrical conductivity of the flat contact socket, the base is preferably formed continuously opposite the positive engagement recess.

[0020] In the event of a 90° connection, the at least one positive engagement recess can preferably extend parallel to the insertion direction into the flat contact socket. In a 180° connection, the at least one positive engagement recess preferably extends transverse to the insertion direction into the flat contact socket.

[0021] For securing the flat contact socket in a housing, at least one stop surface, which runs parallel or transverse to the insertion direction, can be formed on the socket body by means of the at least one positive engagement recess.

[0022] A housing, for example an insulated housing for receiving the flat contact socket, can have a positive engagement element which, in an assembled state, in which the flat contact socket is received in the housing, is received in the positive engagement recess. In particular, the housing can be formed such that the positive engagement element abuts against another part of the flat contact socket, in particular against the base, when attempting to insert the flat contact socket into the housing in a different orientation than that in which the positive engagement element is received in the positive engagement recess. The interplay of the positive engagement element with the positive engagement recess thus represents an element for fault avoidance during assembly. In the assembled state, the positive engagement element can abut against the stop surface such that a detachment of the flat contact socket from the housing, in particular in the direction of the connection section, is effectively prevented. This applies in particular in the event that a tensile force is exerted on an electrical conductor connected to the connection section.

[0023] In order to obtain a quickly and inexpensively produced flat contact socket, it can be manufactured in particular as a stamped bent part.

[0024] In this case, the base can be formed by a main bending edge which runs transverse to the insertion direction. If the flat contact socket has two legs, said legs can extend away from the main bending edge or a virtual elongation thereof against the insertion direction.

[0025] In particular in the case of a flat contact socket for a 90° connection, the at least one blocking element can be at least partially stamped out from material of the main bending edge and can be downstream of this in the insertion direction. As a result, a particularly simply designed blocking element or a simply formed cantilever can be obtained. In other words, the flat contact socket would be closed in the region of the main bending edge without the blocking element and the cantilever. As the blocking element and preferably also the cantilever are stamped out from the material from which the flat contact socket is manufactured as a stamped bent part, the base

of the flat contact socket does not extend continuously along the main bending edge.

[0026] In an embodiment for a 180° connection, the at least one cantilever can extend from a leg, at least in sections, in the direction of the connection section. The at least one blocking element can protrude from this cantilever in the direction of the opposite leg.

[0027] In order to further improve the stability of the flat contact socket according to the invention, in particular in order to prevent the at least two legs from bending apart, the flat contact socket can have at least one latching element which connects or latches the leg ends, which point against the insertion direction, to each other.

[0028] The flat contact socket according to the invention can have lateral guide elements which are shaped in particular by stamping and bending, which are formed monolithically with the socket body, and which can guide a flat contact transverse to the insertion direction. The guide elements are in particular arranged such that they can at least partially close two legs on a side which is arranged transverse to the insertion direction.

[0029] In case the flat contact socket according to the invention is to be received in a housing, the flat contact socket can be provided with at least one groove on an outer face of the blocking element, which groove is formed to positively receive at least one complementary formed position-securing element of the housing.

[0030] Hereinafter, the invention is explained in greater detail by way of example using advantageous embodiments with reference to the drawings. The combinations of features illustrated in the embodiments by way of example can be supplemented accordingly by additional features for a particular application in accordance with the comments above. It is also possible, also in accordance with the comments above, for individual features to be omitted in the described embodiments, if the effect of this feature is not important in a specific application.

[0031] In the drawings, the same reference numbers are always used for elements with the same function and/or the same structure.

[0032] In the drawings:

Fig. 1 shows a perspective illustration of a first embodiment of the flat contact socket according to the invention for a 90° connection;

Fig. 2 shows a cross-section through the socket body of the flat contact socket from Fig. 1;

Fig. 3 shows a longitudinal section through the flat contact socket from Fig. 1 with a view onto a contacting plate on the contacting section;

Fig. 4 shows the flat contact socket from Fig. 1 with a flat contact received in the flat contact receptacle;

Fig. 5 shows a cut-away of a flat contact socket according to Fig. 1 in a housing with a received flat contact;

Fig. 6 shows a perspective illustration of a second embodiment of the flat contact socket according to the invention for a 180° connection; and

Fig.7 shows a longitudinal section through the flat contact socket from Fig. 6.

[0033] Hereinafter, the fundamental structure of a flat contact socket 1 according to the invention for a 90° connection is described using Fig. 1. The flat contact socket 1 has a connection section 3 for electrically connecting to an electrical conductor. The connection section 3 can in particular be a crimping section and feature at least two crimping wings 5. Alternatively, the connection section 3 can also be formed for otherwise connecting to an electrical conductor, in particular to a cable.

[0034] A socket body 7 is connected to the connection section 3. The socket body 7 serves substantially to connect to a flat contact (here not yet shown). For this purpose, the socket body 7 has a flat contact receptacle 9. The flat contact receptacle 9 extends along a flat contact plane 11, which is indicated by dotted lines in Fig. 1.

[0035] The flat contact receptacle 9 is opened for introducing a flat contact through an insertion opening 13. A blocking element 15 is arranged on an end of the socket body 7 which is opposite the insertion opening 13, which blocking element 15 delimits the depth of penetration for a flat contact in the flat contact receptacle 9. The insertion direction 17 extends from the insertion opening 13 in the direction of the blocking element 15. The insertion direction 17 runs parallel to the flat contact plane 11. The insertion opening 13 and the blocking element 15 are thus opposite each other in the insertion direction 17.

[0036] Generally, the flat contact socket 1 extends along a longitudinal direction 19 which runs transverse to the insertion direction 17. The connection section 3 and the socket body 7 are adjoining in the longitudinal direction 19. In the illustrated exemplary embodiment, the connection section 3 is configured such that an electrical conductor, in particular a cable, after connecting to the connection section 3 and by means of crimping, also initially runs substantially parallel to the longitudinal direction 19 in the region which is directly adjacent to the flat contact socket 1. However, the flat contact socket 1 according to the invention can also have a different shape. For example, the connection section 3 can be connected to the socket body 7 such that the connection section 3 extends away from it, parallel to the insertion direction 17. Also alternatively, the connection section 3 can extend transverse to the insertion direction 17 and transverse to the longitudinal direction 19, in Fig. 1 this would accordingly be upwards or downwards.

[0037] The socket body 7 has two flat legs 21 which are opposite each other transverse to the flat contact plane 11. The legs 21 delimit the flat contact receptacle

9 transverse to the flat contact plane 11. Preferably, the legs 21 are substantially continuously formed. Alternatively, they can also have openings in order to save on material, for example. On one of the ends 23 of the flat contact socket 1 opposite the connection section 3, the two legs 21 are connected to each other by a web 25. On one of the ends of the socket body 7 opposite the web 25 in the longitudinal direction 19, the two legs 21 are connected by the base 27.

[0038] The base 27 runs transverse to the insertion direction 17 or parallel to the longitudinal direction 19 and forms a kind of backbone for the flat contact socket 1. The base 27 is opposite the insertion opening 13 in the insertion direction 17 and connects the socket body 7 to the connection section 3. Preferably, the base 27 is continuously formed at least between the socket body 7 and the connection section 3, such that it has a good electrical conductivity.

[0039] The flat contact socket 1 is preferably manufactured as a stamped bent part from an electrically conductive material 28. In this case, the region of the base 27 can in particular be formed by a main bending edge 29 which runs transverse to the insertion direction 17. The two legs 21 are correspondingly formed by two flat regions bending towards each other around the main bending edge 29. Manufacturing by stamping and bending enables the flat contact socket 1 to be manufactured quickly and cost-efficiently. Moreover, stamping and bending also allows a particularly simple production of the blocking element 15, which is explored hereinafter.

[0040] The blocking element 15 is connected to a cantilever 31 which extends away from the rest of the socket body 7 in the insertion direction 17. The blocking element 15 protrudes from the cantilever 31, transverse to the insertion direction 17 and transverse to the longitudinal direction 19, i.e. transverse to the flat contact plane 11.

[0041] By arranging the blocking element 15 on the cantilever 31, which extends in the insertion direction 17, it is possible to receive a flat contact in the flat contact receptacle 9, which projects at least partially beyond the base 27 or beyond the rest of the socket body 7 in the insertion direction 17. In this way, a flat contact can be received which comprises additional elements, for example a touch protector.

[0042] The blocking element 15 is spaced apart from the rest of the flat contact receptacle 9 by the arrangement previously described. The blocking element 15 is preferably manufactured integrally with the socket body 7 and particularly preferably manufactured integrally with the rest of the flat contact socket 1. This can be achieved in particular if the flat contact socket 1 is formed as a stamped bent part. The blocking element 15 and the cantilever 31 can in this case be stamped out from the material 28 of the flat contact socket 1, which, without a blocking element 15 according to the invention, would form a continuous base 27 in the region of the socket body 7. It can continuously transition into one of the two legs 21, and the free end which forms the blocking element 15 can be bent up transverse to the insertion direction and transverse to the longitudinal direction 19.

[0043] The blocking element 15 has two braces 33, via which it is connected to the cantilever 31. The blocking element 15 is therefore formed like a beam and connected to the cantilever 31 via two braces 33 which are spaced apart. Alternatively, the region between the braces 33 can also be closed. However, material 28 is preferably stamped out or removed there, in order to reduce the necessary bending forces for producing the shape of the blocking element 15 or for bending up the material 28.

[0044] In order to effectively delimit the flat contact receptacle 9 in the insertion direction 17 by the blocking element 15, the blocking element 15 extends over half the height 35 of the flat contact receptacle 9. The height 35 of the flat contact receptacle 9 is measured as the spacing between the inner faces 37 of the two legs 21 transverse to the flat contact plane 11.

[0045] In order to prevent a flat contact from slipping out of the flat contact receptacle 9, in particular when being introduced, the flat contact socket 1 can also feature further blocking or guide elements. In the preferred embodiment, the end 23 of the flat contact socket 1 is provided with two lateral blocking elements 39. The lateral blocking elements 39 close the flat contact receptacle 9 in the direction of the end 23. They are preferably formed by stamping and bending from material 28 of the legs 21, wherein an approximately quadrantal lateral blocking element 39 extends from each leg 21 in the direction of the opposite leg 21. The orientation of the two lateral blocking elements 39 is thus opposing.

[0046] The flat contact socket 1 has two latching elements 41 for laterally guiding a flat contact upon insertion into the flat contact receptacle 9 and for fixing the position of the legs 21 to each other. The latching elements 41 are arranged laterally from the flat contact receptacle 9. This means that they are arranged oppositely in the longitudinal direction 19, wherein the flat contact receptacle 9 as viewed in the longitudinal direction 19 is arranged between them. The latching elements 41 delimit the insertion opening 13 laterally or in the longitudinal direction 19.

[0047] Each of the latching elements 41 extends from one of the legs 21 to the opposite leg 21. Each of the latching elements 41 has a positive engagement opening 43. This is preferably arranged at the free end 45 of the latching element 41. The latching element 41 is formed substantially strip-shaped and can be stamped from material 28 of one of the two legs 21.

[0048] For latching, the latching element 41 is bent in the direction of the opposite leg 21 such that the positive engagement opening 43 is arranged on a level with the leg 21. This leg 21 has a positive engagement protrusion 47 which is arranged in the positive engagement opening 43 in the connected state. In this way, a positive engagement is formed transverse to the insertion direction 17. This prevents both the unintentional opening or compressing of the two legs 21 from each other or towards

each other, and a displacement of the two legs 21 in the longitudinal direction 19.

[0049] The flat contact socket 1 has a positive engagement recess 49 which extends substantially parallel to the insertion direction 17 into the flat contact socket 1. The positive engagement recess 49 extends in the direction of the base 27 from that side of the flat contact socket 1 which is opposite the base 27, against the insertion direction 17.

[0050] The positive engagement recess extends substantially between the socket body 7 and the connection section 3. The positive engagement recess 49 can serve to receive a substantially complementary formed positive engagement element of a housing (not illustrated). By virtue of the fact that the base 27 is continuously formed on the side which is opposite the positive engagement recess, the flat contact socket 1 can preferably only be inserted into the housing if the positive engagement element of the housing is arranged in the positive engagement recess 49. By attempting to insert the flat contact socket 1 in another orientation into the housing, the base 27 can abut against the positive engagement element, for example, such that the insertion into the housing or a closing of a housing is prevented. This function is explored subsequently with reference to Fig. 5.

[0051] The positive engagement recess 49 extends so far in the direction of the base 27 into the material of the flat contact socket 1 that the crimping wings 5 of the connection section 3 are shaped by the positive engagement recess 49 or by an elongation 51 of the positive engagement recess 49.

[0052] Preferably, a stop surface 53 is formed on the socket body 7 by the positive engagement recess 49, which stop surface 53 runs parallel to the insertion direction 17. If the flat contact socket 1 is arranged in a housing and if a positive engagement element of the housing is located against the stop surface 53, the flat contact socket 1 being pulled out of the housing under a tensile force acting in the direction of the connection section 3 can be effectively prevented by a positive engagement of the stop surface 53 with the positive engagement element.

[0053] Fig. 2 shows some elements of the flat contact socket 1 in an enlarged representation and in a cross-section through the socket body 7 transverse to the longitudinal direction 19.

[0054] Fig. 2 shows that the blocking element 15 extends over half the height 35 in the direction of an opposing leg 21. It thus effectively prevents the introduction of a flat contact into the flat contact receptacle 9 beyond the blocking element 15. The blocking element 15 is downstream of the rest of the socket body 7 in the insertion direction 17. The lateral blocking elements 39 close the flat contact receptacle 9 effectively transverse to the insertion direction 17.

[0055] Further details of the flat contact socket 1, which are not described with reference to Fig. 1 or are not illustrated or to be seen in Fig. 1, are described hereinafter with reference to Figs. 2 and 3.

[0056] The legs 21 have contacting sections 55. The contacting sections 55 serve to electrically contact a flat contact arranged in the flat contact receptacle 9. The contacting sections 55 are arranged on the inner faces 37 of the legs 21. It is also possible that only one of the two legs 21 has a contacting section 55 for electrical contacting. Alternatively, one of the legs 21 can also be provided with a press-on organ, for example, which is formed to mechanically fix a flat contact in the flat contact receptacle 9.

[0057] In order to improve the electrical connection between the flat contact socket 1 and a flat contact, each contacting section 55 has several contact springs 57, which project into the flat contact receptacle 9 and are resiliently deflectable towards the respective leg 21. Each of the inner faces 37 in the contacting section 55 preferably has a contacting plate 59 which is provided with a plurality of contact springs 57. The contacting plates 59 are electrically conductively connected to the respective legs 21. The contacting plates 59 are preferably welded to the inner faces 37 of the legs 21.

[0058] The two contacting plates 59 are opposite each other across the flat contact receptacle 9. The contacting plates 59 or the contacting sections 55 are preferably spaced apart from the blocking element 15 against the insertion direction 17. The free space 61, which extends between the contacting sections 55 and the blocking element 15, can serve to receive a touch protector for example, which can be arranged around an electrically conductive part of a flat contact. This is described hereinafter with reference to Fig. 4.

[0059] Fig. 4 shows a flat contact socket 1 of the kind previously described with a part of a flat contact 63 arranged in the flat contact receptacle 9. The flat contact 63 can have an electrically conductive part 65. The electrically conductive part 65 is preferably surrounded by a touch protector 67. Contacting surfaces 69 of the electrically conductive part of the flat contact 63 are exposed.

[0060] In the inserted state, the flat contact 63 abuts against the blocking element 15 with a front end 71 of the touch protector 67. The front end 71 of the touch protector 67 is arranged in the free space 61. At the same time, the contacting surfaces 69 can be located against the two contacting sections 55 of the flat contact socket 1 such that an electrical connection is established.

[0061] Hereinafter, a flat contact socket 1 according to the invention of the kind previously described is described in a housing with reference to Fig. 5. Fig. 5 illustrates the flat contact socket 1 with a flat contact 63 arranged in the flat contact receptacle 9.

[0062] The flat contact socket 1 is arranged in a two-part housing 73. The housing 73 includes an upper part 75 and a lower part 77. The two parts 75 and 77 can be connected, for example, by suitable catching elements (not illustrated) or other connection means in an assembled state, as shown in Fig. 5.

[0063] The housing 73 includes an opening 79 through which a flat contact 63 can enter into the interior of the

housing 73 and thus into the flat contact receptacle 9 of the flat contact socket 1. Preferably, the housing 73 has at least one further opening (not shown) through which an electrical conductor can be connected to the connection section 3 of the flat contact socket 1.

[0064] The housing 73 has on the lower part 77 a positive engagement element 81 which protrudes into an interior of the housing 73. In the assembled state shown in Fig. 5, the positive engagement element 81 is arranged in the positive engagement recess 49 of the flat contact socket 1 and is located against the stop surface 53. The flat contact socket 1 is thereby positively secured against being pulled out of the housing 73 in the direction of the connection section 3. The interplay between the positive engagement element 81 and the positive engagement recess 49 also serves to avoid faults when assembling the housing parts 75 and 77 or when inserting the flat contact socket 1 into the housing 73. If, for example, the flat contact socket 1 was inserted into the lower part 77 such that the base 27 was located against the positive engagement element 81, the upper part 75 could no longer be moved towards the lower part 77 such that the two parts could be connected.

[0065] The upper part 75 has a pressing element 83 which is arranged opposite the positive engagement element 81 against the insertion direction 17. In the assembled state, the pressing element 83 presses on the base 27 of the flat contact socket 1 such that it is held securely in the insertion direction 17. Moreover, the upper part 75 of the housing can have one or more protrusions 85, which press against the blocking element 15 of the flat contact socket 1 in the assembled state, in order to ensure a secure fitting of the flat contact socket 1 in the housing 73 in the region of the blocking element 15 too. Furthermore, vibrations or oscillations of the blocking element 15 can thus be reduced. In an alternative configuration, for each of the protrusions 85 the blocking element 15 can have a depression or groove into which the protrusion 85 can enter such that an additional positive engagement can also be obtained therein, transverse to the insertion direction 17.

[0066] The structure of a second advantageous embodiment of the flat contact socket 1 according to the invention is described hereinafter with reference to Figs. 6 and 7. For the sake of brevity, only the differences from the embodiments which are described with reference to Figs. 1 to 5 are explored.

[0067] The second embodiment can be used for a 180° connection. This means that the socket body 7 and the connection section 3 are arranged relative to each other such that an electrical conductor runs substantially parallel to the insertion direction 17, at least in the connection section 3.

[0068] Consequently, the insertion direction 17 runs parallel to the longitudinal direction 19. The insertion opening 13 is therefore arranged on the end of the socket body 7 located in the longitudinal direction 19 and not on the side thereof.

[0069] The blocking element 15 extends from one of the legs 21 in the insertion direction 17 and therefore substantially in the direction of the connection section 3. The cantilever 31, which extends in the insertion direction 17, and the blocking element 15, which protrudes transverse to the insertion direction 17, thus merge into each other. The blocking element 15 and the cantilever 31 can be formed as a bent tongue 87, the end section 89 thereof being formed by the blocking element 15. As with the previously described embodiment, the blocking element 15 extends transverse to the flat contact plane 11 over half the height 35 of the flat contact receptacle 9.

[0070] As with the first embodiment of the flat contact socket 1 according to the invention, here too the two legs 21 are connected to each other by latching elements 41. However, in the second embodiment, in the region between the two latching elements 41, a blocking web 91 extends which prevents an unintentional insertion of a flat contact transverse to the insertion direction 17, i.e. between the two latching elements 41.

[0071] The cantilever 31 extends from the latching element 41 which is located nearer to the connection section 3. This means that the cantilever 31 extends from the part of the leg 21 which is provided with the positive engagement protrusion 47 of this latching element 41. Consequently, what follows from the arrangement is that the cantilever 31 and the positive engagement protrusion 47 run substantially perpendicular to each other.

[0072] The arrangement of the blocking element 15 in the second embodiment does not rule out the presence of a positive engagement recess 49 with a stop surface 53 which runs transverse to the longitudinal direction 19. In the second embodiment, the positive engagement recess 49 does not extend through the flat contact socket 1 continuously transverse to the flat contact receptacle 11. Instead, the stop surface 53 is arranged on the leg 21 which is opposite the blocking element 15. The positive engagement recess 49 extends between this stop surface 53 and the two crimping wings 5 of the connection section 3.

Reference numbers

[0073]

1	Flat contact socket
3	Connection section
5	Crimping wing
7	Socket body
9	Flat contact receptacle
11	Flat contact plane
13	Insertion opening
15	Blocking element
17	Insertion direction
19	Longitudinal direction
21	Legs
23	End of the flat contact socket
25	Web

27 Base
28 Electrically conductive material
29 Main bending edge
31 Cantilever
33 Braces
35 Height of the flat contact receptacle
37 Inner faces of the legs
39 Lateral blocking elements
41 Latching elements
43 Positive engagement opening
45 Free end of a latching element
47 Positive engagement protrusion
49 Positive engagement recess
51 Extension of the positive engagement recess
53 Stop surface
55 Contacting section
57 Contact spring
59 Contacting plate
61 Free space
63 Flat contact
65 Electrically conductive part of the flat contact
67 Touch protector
69 Contact surface
71 Front end of the flat contact
73 Housing
75 Upper part of the housing
77 Lower part of the housing
79 Opening for flat contact
81 Positive engagement element
83 Pressing element
85 Protrusion
87 Tongue
89 End section of the tongue
91 Blocking web

Claims

1. A flat contact socket (1) with a connection section (3) for electrically connecting to an electrical conductor and to a flat contact receptacle (9), which extends in a socket body (7) along a flat contact plane (11), which is spaced apart from the connection section (3), and into which a flat contact (63) can be inserted through an insertion opening (13) along an insertion direction (17), wherein the flat contact socket (1) has at least one blocking element (15) which is opposite the insertion opening (13) in the insertion direction (17) and which delimits the flat contact receptacle (9) at least in the insertion direction (17), **characterised in that** the at least one blocking element (15) protrudes transverse to the insertion direction (17) from at least one cantilever (31) which extends in the insertion direction (17).

2. The flat contact socket (1) according to Claim 1, **characterised in that** the at least one blocking element (15) is formed integrally with the rest of the flat contact socket (1).

3. The flat contact socket (1) according to Claim 1 or 2, **characterised in that** the at least one blocking element (15) has at least one brace (33) via which it is connected to the cantilever (31).

4. The flat contact socket (1) according to any one of Claims 1 to 3, **characterised in that** the at least one blocking element (15) extends up to at least half the height (35) of the flat contact receptacle (9) measured transverse to the flat contact plane (11).

5. The flat contact socket (1) according to any one of Claims 1 to 4, **characterised in that** the socket body (7) has at least two legs (21) which are opposite each other transverse to the flat contact plane (11), and by means of which the flat contact receptacle (9) is delimited transverse to the flat contact plane (11).

6. The flat contact socket (1) according to Claim 5, **characterised in that** the at least two legs (21) are connected via at least one web (25) which is opposite the insertion opening (13) in the insertion direction (17).

7. The flat contact socket (1) according to Claim 5 or 6, **characterised in that** at least one of the legs (21) has at least one contacting section (55) on an inner face of the leg (37) for electrical contacting with the flat contact (63).

8. The flat contact socket (1) according to Claim 7, **characterised in that** the at least one contacting section (55) is provided with at least one contact spring (57) which projects into the flat contact receptacle (9) and is resiliently deflectable towards the leg (21).

9. The flat contact socket (1) according to any one of Claims 5 to 8, **characterised in that** the flat contact socket (1) has a base (27) which runs transverse to the insertion direction (17), which is opposite the insertion opening (13) in the insertion direction (17), and by means of which the socket body (7) is connected to the connection section (3).

10. The flat contact socket (1) according to any one of Claims 1 to 9, **characterised in that** the connection section (3) has at least two crimping wings (5) for connecting to an electrical conductor by means of crimping.

11. The flat contact socket (1) according to any one of Claims 1 to 10, **characterised in that** the flat contact socket (1) has at least one positive engagement recess (49), which extends substantially parallel to the insertion direction (17) into the flat contact socket

(1), for producing a positive engagement with a housing (73).

12. The flat contact socket (1) according to Claim 11, **characterised in that** at least one stop surface (53), which runs parallel to the insertion direction (17), is formed by the at least one positive engagement recess (49) on the socket body (7), for securing the flat contact socket (1) in a housing (73).

13. The flat contact socket (1) according to any one of Claims 1 to 12, **characterised in that** the flat contact socket (1) is manufactured as a stamped bent part.

14. The flat contact socket (1) according to Claim 13, **characterised in that** the base (27) is formed by a main bending edge (29) which runs transverse or longitudinal to the insertion direction (17).

15. The flat contact socket (1) according to Claim 14, **characterised in that** the at least one blocking element (15) is at least partially stamped out from material (28) of the main bending edge (29) and is downstream of it in the insertion direction (17).

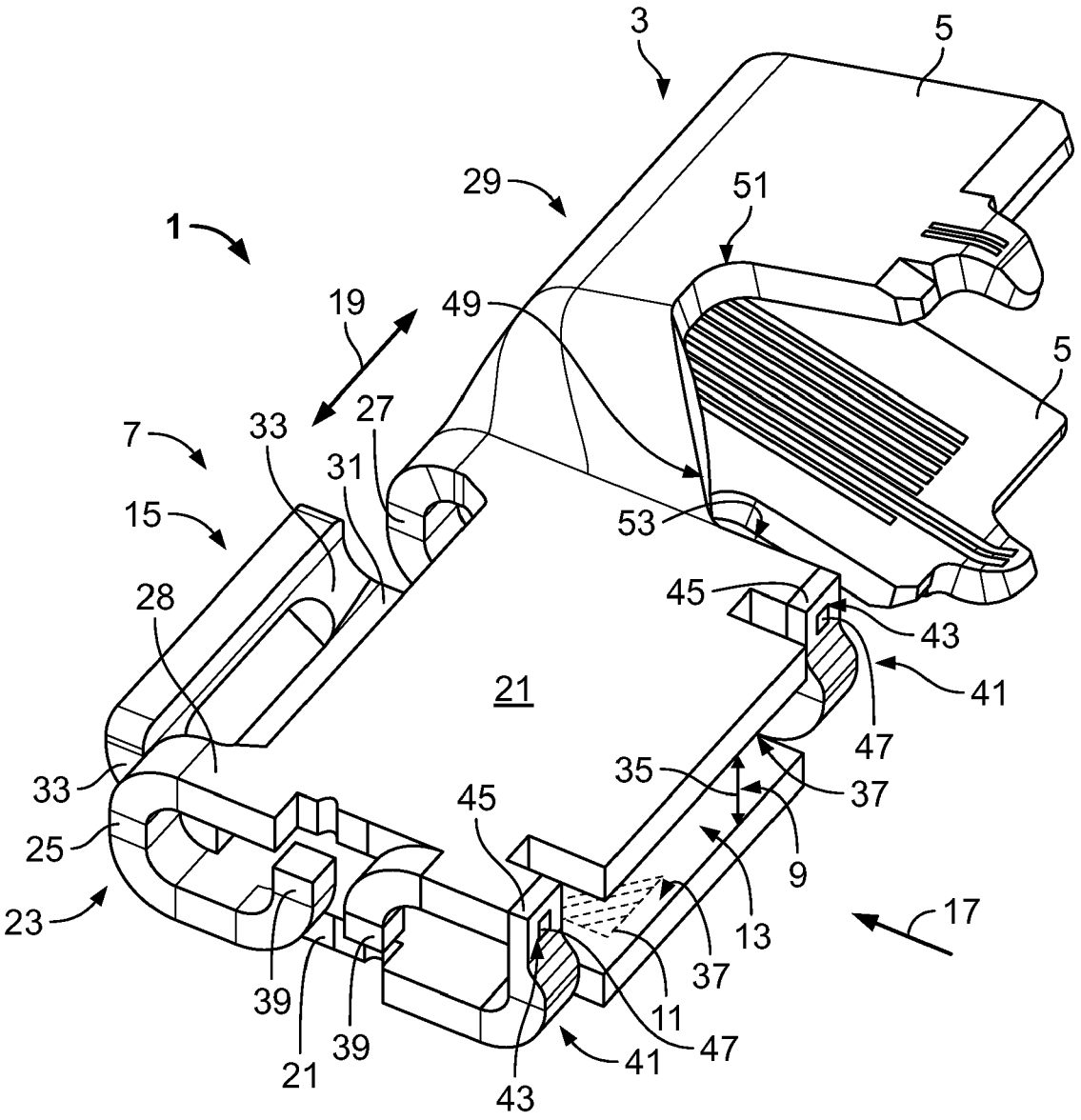
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Fig. 1

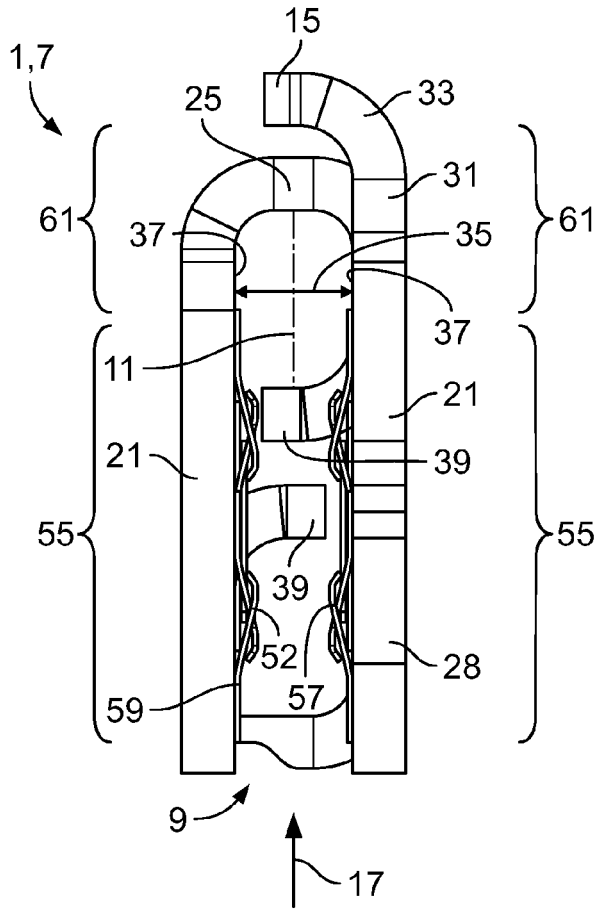
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Fig. 2

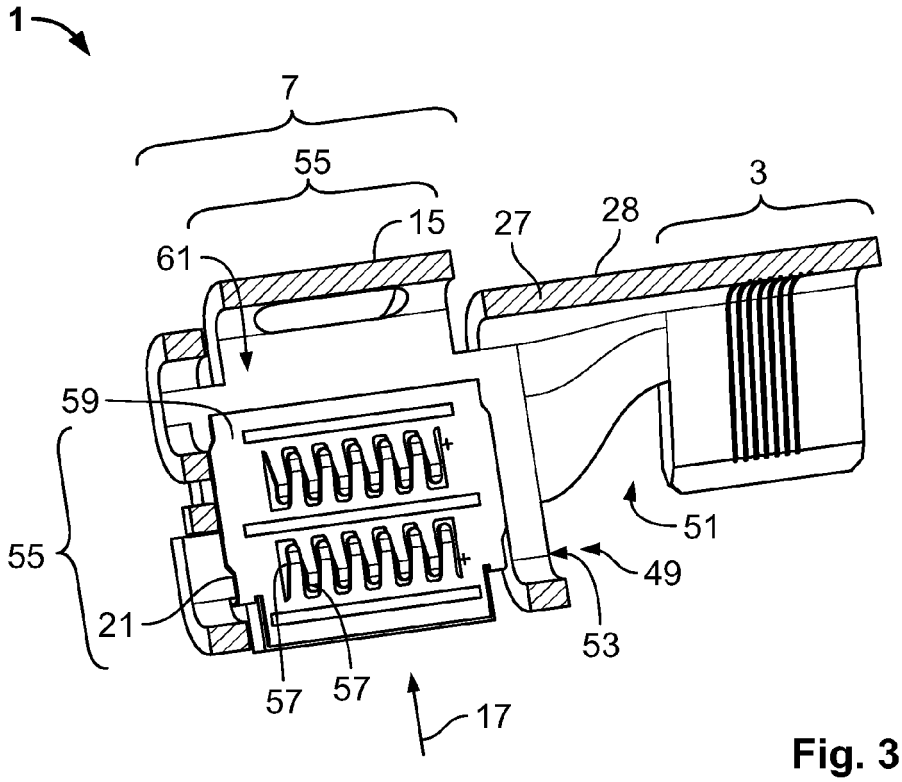
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Fig. 3

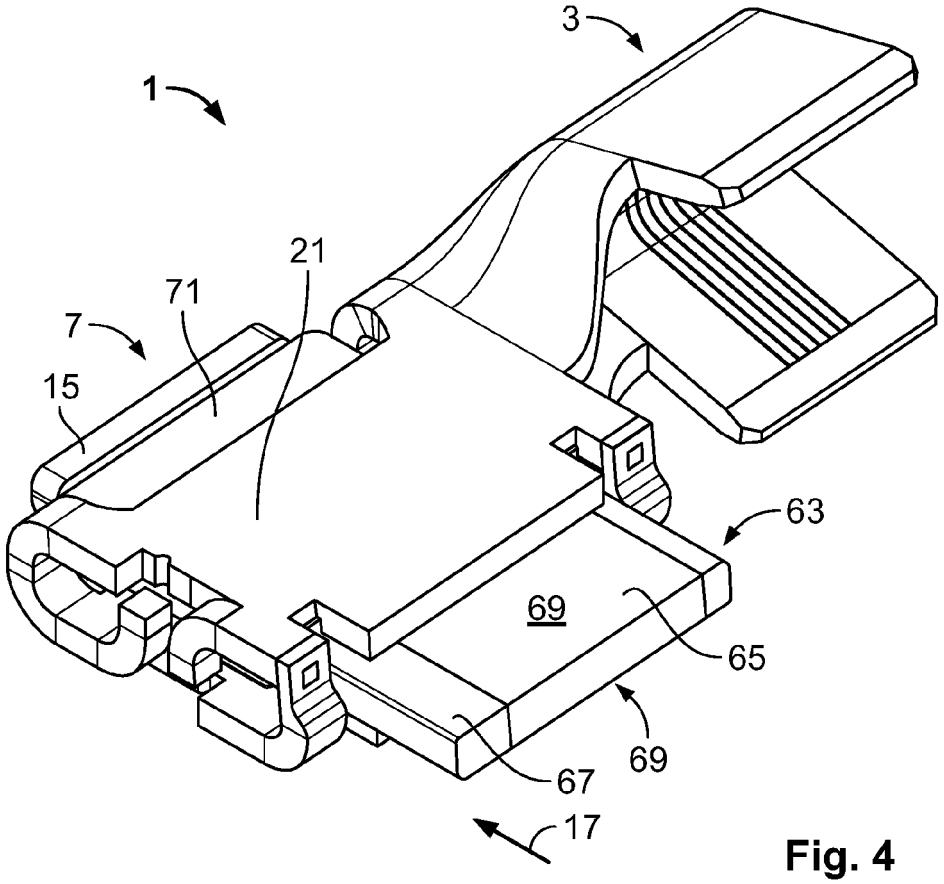

Fig. 4

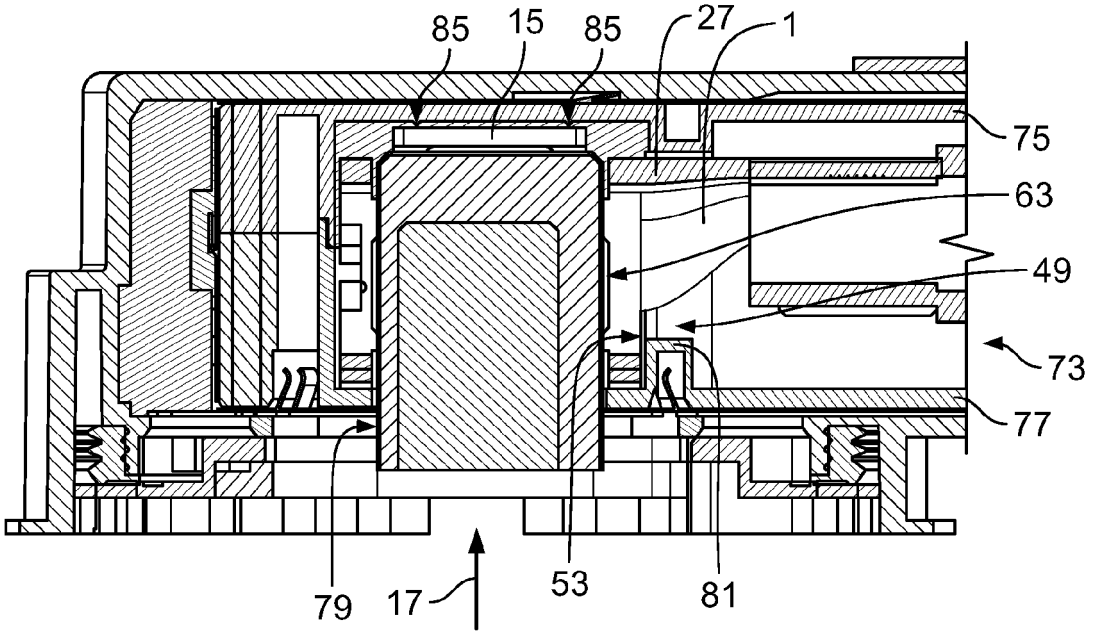

Fig. 5

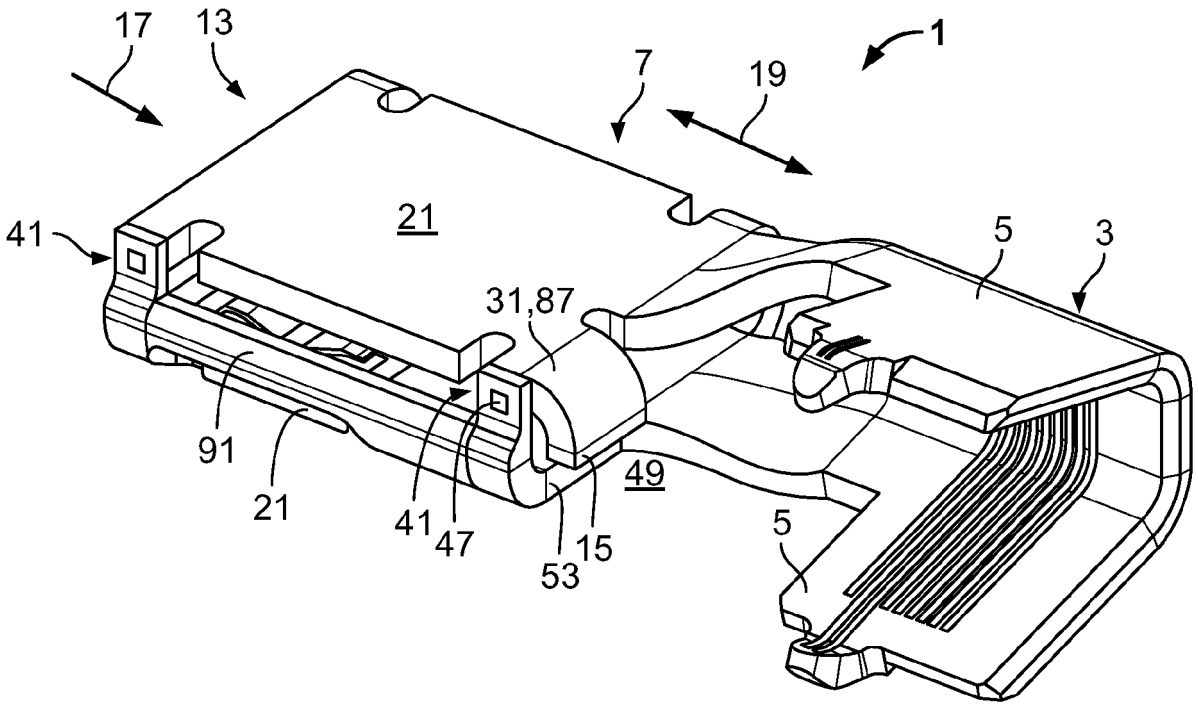
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Fig. 6

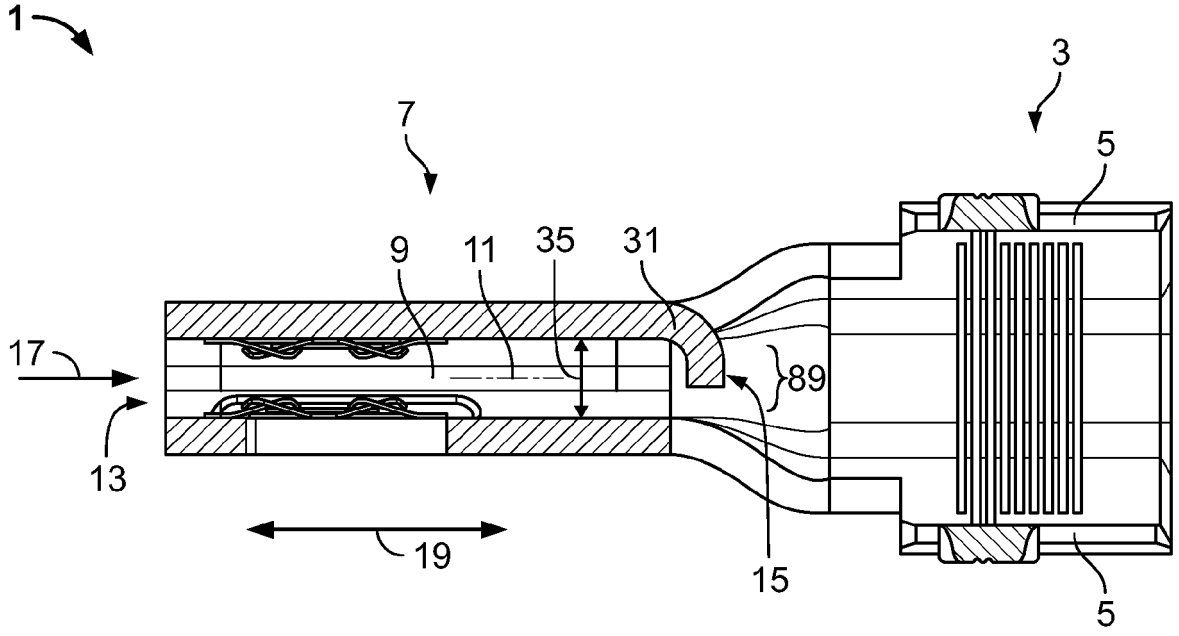
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Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 17 19 8732

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H01R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 February 2018	Gomes Sirenkov E M.

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